WHAT IS CLAIMED IS:

1. A method for assaying for a histamine H_4 receptor-mediated effect, comprising:

(a) performing an investigative assay on a treated sample of whole blood by steps comprising:

treating whole blood from a source with a histamine H_4 receptor antagonist, yielding the treated sample;

adding to the treated sample an assay reagent selected from histamine and specific histamine H_4 receptor agonists, yielding an assay sample; and

analyzing the assay sample to detect the histamine H_4 receptor-mediated effect.

2. A method according to claim 1, wherein said adding step further comprises adding a histamine H_2 receptor antagonist to the treated sample.

3. A method according to claim 1, further comprising before said analyzing:

incubating the assay sample at a temperature and time to facilitate an incubation reaction; and

terminating the incubation reaction and fixing the assay sample with a fixative.

4. A method according to claim 3, wherein said analyzing comprises lysing red cells in the assay sample and detecting eosinophil shape change using flow cytometry.

5. A method according to claim 3, wherein said analyzing comprises adding a staining reagent to the assay sample and detecting adhesion molecule up-regulation using flow cytometry.

6. A method according to claim 5, wherein said staining reagent is selected from fluorescent dye-labeled and phycoerytherine-conjugated anti-CD11b and anti-CD54 antibodies.

7. A method according to claim 3, wherein said analyzing comprises monitoring levels of intracellular free calcium using flow cytometry.

8. A method according to claim 7, further comprising treating the whole blood with a fluorinating agent, and further wherein said monitoring of levels of intracellular free calcium comprises measuring changes in fluorescence.

9. A method according to claim 8, wherein said analyzing comprises staining the assay sample with a fluorescent dye.

10. A method according to claim 3, wherein said analyzing comprises observing cytoskeletal changes using a fluorescent microscope.

11. A method according to claim 10, further comprising staining the assay sample with a fluorescent dye before said analyzing.

12. A method according to claim 1, wherein the source is a human subject in a clinical study, and the method further comprises:

(b) performing a control assay on an untreated sample of whole blood from the source by steps comprising:

adding to the untreated sample the assay reagent, yielding a control sample; and

analyzing the control sample to detect the histamine-mediated effect; and

(c) comparing the results of the investigative assay on the treated sample with the results of the control assay on the control sample.

13. A method according to claim 12, wherein said adding step of the investigative assay (a) further comprises adding a histamine H_2 receptor antagonist to the treated sample, and said adding step of the control assay (b) further comprises adding said histamine H_2 receptor antagonist to the untreated sample.

14. A method according to claim 12, wherein said treating step comprises administering the histamine H_4 receptor antagonist to the human subject according to a dosing regimen, and said assay on the control sample is performed before said treating.

15. A method according to claim 14, further comprising drawing whole blood from the human subject at selected time intervals during the dosing schedule to periodically provide treated samples, and performing said investigative assay on each of the treated samples.

16. A method according to claim 1, wherein the source is a human patient undergoing diagnosis for a disease or medical condition suspected of being mediated by histamine H_4 receptor activity.

17. A method for assaying for a histamine H_4 receptor-mediated effect, comprising:

(a) performing a control assay on a sample of whole blood from a source untreated with any histamine H_4 receptor antagonist by steps comprising:

adding to the untreated sample an assay reagent selected from histamine and specific histamine H_4 receptor agonists, yielding a control sample; and

analyzing the control sample to detect the histamine H_4 receptor-mediated effect.

18. A method according to claim 17, wherein said adding step further comprises adding a histamine H_2 receptor antagonist to the untreated sample.

19. A method according to claim 17, wherein said analyzing comprises detecting eosinophil shape change, cytoskeletal change, adhesion molecule up-regulation, or calcium flux.

20. A method according to claim 19, further comprising:

(b) performing an investigative assay on a treated sample of whole blood by steps comprising:

treating whole blood from the source with a histamine H_4 receptor antagonist, yielding the treated sample;

adding to the treated sample an assay reagent selected from histamine and specific histamine H_4 receptor agonists, yielding an assay sample; and

analyzing the assay sample to detect the histamine H_4 receptor-mediated effect; and

(c) comparing results of the control assay of the control sample with results of the investigative assay of the treated sample.

21. A method according to claim 20, wherein said adding step of the control assay (a) further comprises adding a histamine H_2 receptor antagonist to the treated sample, and said adding step of the investigative assay (b) further comprises adding said histamine H_2 receptor antagonist to the untreated sample.

22. A method according to claim 20, wherein said treating of the whole blood is conducted *in vivo*.

23. A method according to claim 22, wherein said source is a mammal.

24. A method according to claim 22, wherein said source is a human.